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Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files

DATE: 30 October 1956

25X1

FROM : [redacted] 25X1

SUBJECT: (Contract RD-107, Task Order 4, [redacted]

1. On 25 October 1956, a meeting was held at [redacted] 25X1
[redacted] to discuss the subject task 25X1
order. Present at the meeting were:

[redacted] 25X1

2. [redacted] progress in this task order has been most 25X1
encouraging. The design technique of the S-T antenna has been reduced to the point where each antenna of the matrix can be tuned separately to any very low frequency. The band width of the antenna is determined by the amount of loading (maximum Q=200). Effective height is added merely by adding more antennas in parallel. The experimental design as described in the last monthly report has a physical size of 14 x 9 1/4 x 4 1/2 inches in the extended position, collapsing to 14 x 9 1/4 x 2 1/2 inches. This antenna has an effective height approximately five times greater than the air core comparison loop. [redacted] has been able to sinter 18 inch 25X1
ferrite rods and these will be incorporated in the deliverable antenna. This antenna will have dimensions of 14 x 18 x 4 1/2 collapsible to 14 x 18 x 2 1/2 inches. The antenna with 18 inch rods will have an effective height approximately 10 times greater than that of the air core loop. The present design supports the ferrite rods at either end and may be too fragile for extremely rough handling. In [redacted] opinion, addi- 25X1
tional polystyrene supports would have very little effect on antenna sensitivity.

3. The antenna exhibits the very definite nulls associated with loop antennas (50 db estimated). Inasmuch as the band width is determined almost entirely by the loading, a good impedance match is very important. The antenna has been designed for a 72 ohm output impedance to yield 2000 cycle band width. By a suitable Transformer This impedence could be changed To any other value without changing the Bandwidth

4. [redacted] was requested to include complete design information in their 25X1
final report. As stated above, the design appears very straight forward with effective height, antenna frequency in the VLF band, and band width all easily variable.

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5. [redacted] was requested to supply information on the experimental method of setting up a test field and the determination of effective height of any loop antenna tested within that field. 25X1

6. [redacted] explained that in the initial test of the air core loop, the twin lead transmission line was allowed to touch the test field generation loop which had the effect of inducing very high currents in the transmission line. When the test was repeated using shielded transmission line taken out at the center of the field generation loop, the effective height of the air core loop was as shown in the last monthly report. This calculation of effective height does not include Q because in this application the output impedance is so low. 25X1

[redacted] 25X1

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